SPARCE HEADQUARTERS

October/November/December 2009

Volume 17 Number 4

The Pacific Tradewinds Quarterly

Inside this issue:

Kiribati in the Bull's-eye of a Total Solar Eclipse

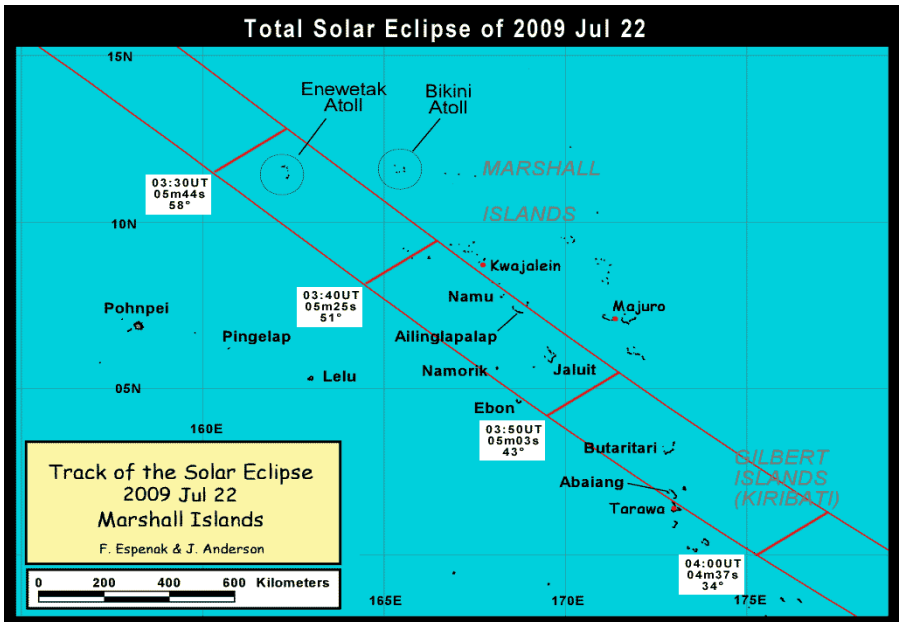
Wednesday, July 22, 2009

By Howard Diamond

A rare yet spectacular event took place in a narrow belt around the equator, and our friends in Kirabati, particularly those on Butaritari Island, were front and center for this event. In fact, Butaritari was in right on the center line of the eclipse beginning about 0355 UTC and lasting for nearly 5 full minutes. The path of the moon's umbral shadow began in India and crossed through Nepal, Bangladesh, Bhutan, Myanmar and China. After leaving mainland Asia, the path crossed Japan's Ryukyu Islands and curved southeast through the Pacific Ocean where the maximum duration of totality reached 6.5 minutes, the longest eclipse the Earth will see until the year 2131. A partial eclipse was seen within the much broader path of the moon's penumbral shadow, which included most of eastern Asia, Indonesia, and the Pacific Ocean.

2010 Eclipse

The region will also be very fortunate in 2010, as the world's next total solar



Questions/Comments:
Editor: Nikki Acton
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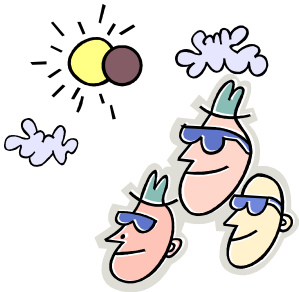
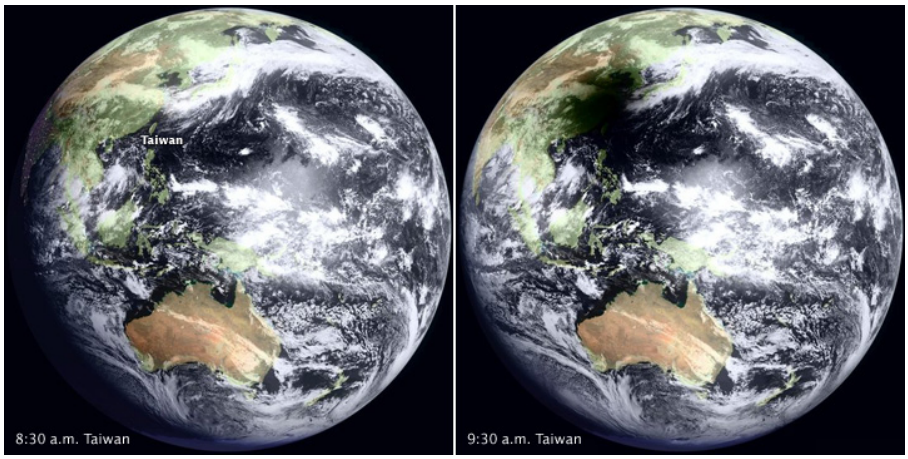
"It is always important to exercise extreme caution and NEVER view an eclipse directly as severe eye damage can occur."

eclipse will occur on Sunday, July 11, 2010, and will be visible from within a narrow corridor that traverses Earth's southern hemisphere. The path of the Moon's umbral shadow will cross the South Pacific where it make landfall only on Mangaia in the Cook Islands and Easter Island (Isla de Pascua) off the coast of Chile. The path of totality will end just after reaching southern Chile and Argentina. The Moon's penumbral shadow will produce a partial eclipse visible from a much larger region covering the South Pacific and the southern portion of South America. It is always important to exercise extreme caution and NEVER view an eclipse directly as severe eye damage can occur.

Much more information on solar eclipse eye safety can be found at http://eclipse.gsfc.nasa.gov/SEhelp/safety2.html. Another eye safety site can be found at http://www.everydayhealth.com/vision-center/the-healthy-eye/tips/eye-safety-during-solar-eclipses.aspx..

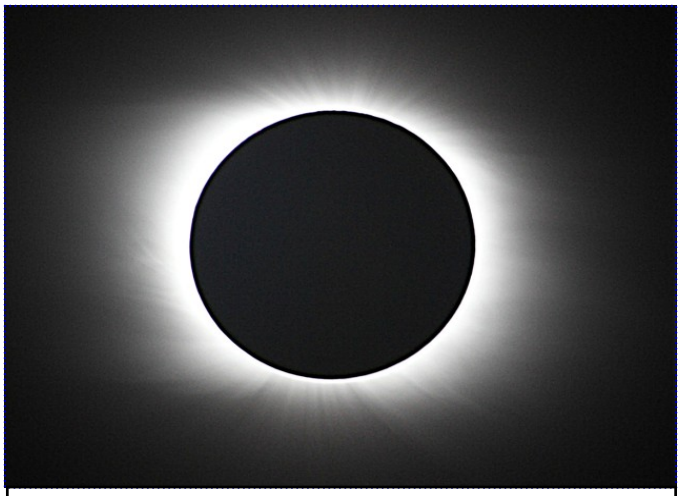
Thanks go to NASA's Solar Eclipse Web Site at http://eclipse.gsfc.nasa.gov/eclipse.html for a lot of the information in the article.





A view of the eclipse from space.

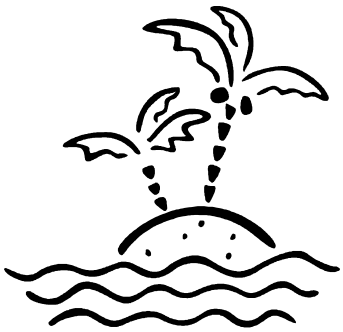
Image courtesy of: NASA Earth Observatory, http://earthobservatory.nasa.gov/images/imagerecords/39000/39520/eclipse_MTS_2009



Totality of the eclipse. Picture taken near Kiribati.

Image: © www.icstars.com

Ocean Rower and Environmental Campaigner Completes Second Stage of Her Solo Row Across the Pacific Ocean



Second Stage of Three-Part Voyage Inspires Action on Climate Change

Sunday, September 6, 2009

Tarawa, Republic of Kiribati—Roz Savage, ocean rower and environmental campaigner, made landfall today on Tarawa, a small atoll in the Republic of Kiribati, successfully completing stage 2 of her epic bid to become the first woman in history to row solo across the Pacific Ocean. She launched this stage of her voyage on May 24, from Honolulu, Hawaii. She spent 104 days at sea, bringing the total number of days alone at sea for her Pacific crossing to 203 days. Savage uses her ocean rowing adventures to help inspire action on environmental issues.

Savage posted Twitter updates from her satellite phone for each of the last 10 miles as she neared the finish line, providing fans around the world with a thrilling conclusion to a very exciting adventure. She wrote, "Into the last 10 miles. Quick chat with mum on satphone. She's excited!" Two hours later, she tweeted, "7 miles has never seemed so far... sun is scorching hot now." Upon arrival she wrote, "ARRIVED!!! Exhausted but very, very happy. Crack open the bubbly and toast the health of the planet."

Savage was welcomed by hundreds of people at Betio Wharf on South Tarawa, where children greeted her with flower leis and local performers honored Savage with traditional songs and dances. Community elders of thanked Savage for bringing awareness to the issue of climate change, particularly on behalf of especially vulnerable low-lying islands and atolls, such as Tarawa.

"What a spectacular welcome – I'm so delighted to be here in Kiribati and to meet the wonderful people of Tarawa. Being here is especially poignant for me, knowing that this land and the people who live here are some of the earliest and most seriously impacted by the devastating effects of climate change. I promise to carry their story with me and hope that by sharing this adventure, people around the world will feel compelled to take actions in their own lives to reduce harmful carbon emissions."

Savage's voyage consists of three stages, each with its own environmental message. In Summer 2008, she became the first woman ever to row solo from California to Hawaii. Her 2,700-mile, 99-day journey took her through the outskirts of the North Pacific Garbage Patch. During the first stage of the row, she encouraged people to cut back on their use of disposable plastic bottles, cups and bags, thereby reducing the amount of plastic that ends up in the ocean.

Savage's journey this year from Hawaii to Tarawa targeted climate change. She is a United Nations Climate Hero, and this December Savage will travel

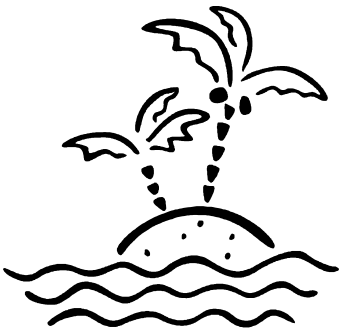
"...I promise to carry their story with me and hope that by sharing this adventure, people around the world will feel compelled to take actions in their own lives to reduce harmful carbon emissions."
- Roz Savage, upon arrival in Tarawa

Welcoming Roz to as she arrives in Tarawa.

to Copenhagen where delegates from around the world will gather to negotiate a new global agreement on climate change. Savage hopes to share video testimonials from the people she meets in Tarawa with world leaders at the Copenhagen summit, highlighting the critical importance of immediate and aggressive action on reducing global carbon emissions.

The third and final stage of Roz's solo row across the Pacific will take place in 2010, and will take her all the way to Australia.

AN UNLIKELY ADVENTURER



Roz is a British ocean rower, author, motivational speaker, and environmental campaigner who uses her trans-oceanic rowing voyages to inspire a movement towards sustainable living at both grassroots and global levels.

Roz first gained international attention in 2005, when after 11 years as a management consultant, she embarked upon a new life of adventure by rowing solo across the Atlantic. Her unlikely transformation from office worker to ocean rower, described with humor and soul-baring honesty in her blogs, captivated and inspired a worldwide audience, transcending barriers of language, culture, color, and creed. Encouraged by this positive response, Roz continues to use her seafaring adventures to motivate others to take action on environmental issues and to face their own life challenges.

THIS YEAR'S MISSION: PULL TOGETHER

Pull Together is the theme for stage two of Roz's row across the Pacific Ocean. This year her environmental mission is to take action on CO2 levels by inspiring people to walk more and drive less.

"The climate change crisis we face requires immediate action from every level of our global society, but the problem is so grave that many people are overwhelmed and simply don't know what they can do to help," says Roz. "That's why I aim to inspire people to choose simple solutions that cost nothing and are easy to work into the busy routines of their daily lives. You might feel like one little choice doesn't make a big difference, that it's just a drop in the ocean. But those little choices and actions add up quickly – and they do make a world of difference."

In consultation with distinguished environmentalists, government leaders, and outreach specialists, Roz conceived an initiative to tackle the issue at both grassroots and international levels. Calling upon her supporters

around the world to Pull Together, Roz issued a challenge: match her 10,000 oar strokes a day with 10,000 steps a day. An easy way for people to track their steps is to use a pedometer. The idea is to substitute walking for driving, thereby reducing the amount of CO2 released into the atmosphere.

A HIGH TECH ADVENTURE

Roz is an avid technology enthusiast and enjoys sharing her adventures through a variety of social media platforms, including Facebook, Twitter, Flickr, and YouTube. She regularly blogs and records podcasts, delighting her audience and allowing them to vicariously share and experience her thrilling adventures. The RozTracker is an interactive map that supporters use to track Roz's progress across the Pacific and see exactly where she was when she posted blog updates, photos, videos and podcasts.

PARTNERSHIPS

Several key partners have recently joined Roz in her mission to take action on climate change. They include:

United Nations Environment Programme: provides leadership and encourages partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations. Roz was recently named a UNEP Climate Hero.

The Climate Project: founded by Nobel Laureate and former Vice President Al Gore. TCP aims to increase awareness of the climate crisis at a grassroots level worldwide, and supports advocacy and activism to combat the climate crisis.

Blue Planet Foundation: a Hawaii-based organization that seeks to change the world's energy culture, to raise global awareness in order to develop and adopt practical programs to implement clean, efficient, and renewable energy and to create a global response to the increasingly urgent climate crisis.

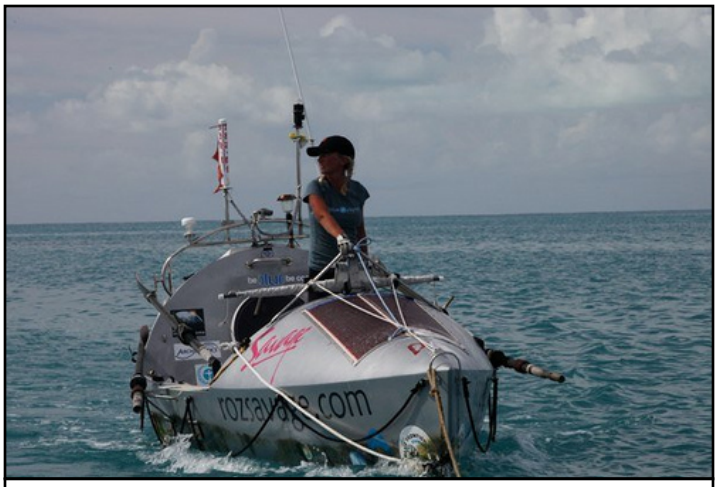
350.org: an international campaign dedicated to creating an equitable global climate treat that lowers CO2 below 350 parts per million, the number that scientists say is the safe number we need to get back to as soon as possible to avoid runaway climate change.

Reprinted from:

Press Release at http://rozsavage.com/2009/09/09/press-release-roz-arrives-in-tarawa/.

Contact Nicole Bilodeau at Nicole@rozsavage.com for more information relating to this press release

All photos for this article are copyright Roz Savage and can be found on her website at http://rozsavage.com/2009/09/07/roz-arrives-in-tarawa-photos/



Roz on finishing up the last bit of her voyage.

Project Kaisei Expedition Departs for the North Pacific Gyre

Two vessels launch voyages to assess marine debris impacts on ocean and to find solutions

Wednesday, July 29, 2009

Setting sail for the North Pacific Gyre.

Image courtesy: Project Kaisei, http://www.projectkaisei.org/images/IMG_3096.jpg

San Francisco, USA —Project Kaisei is an environmental organization established to research and develop innovative solutions to the accumulation of marine debris in convergence zones of the world's oceans. The two ships of this expedition to the North Pacific Gyre will depart on August 2 and August 4. Project Kaisei is focused on finding solutions both in terms of the cleanup and remediation of marine debris, and the education and awareness needed to stop the flow of refuse into our oceans.

"The sooner we see the extent of the problem, the better we can work out feasible ways to clean up the mess…" - Doug Woodring, Co-Founder and Project Director of Project Kaisei

The 174 foot research vessel *New Horizon*, a ship owned by Scripps Institution of Oceanography at UC San Diego, one of the top oceanographic institutions in world, will depart from San Diego on August 2, 2009. On board will be members from the Project Kaisei team which is helping to support the Scripps Environmental Accumulation of Plastic Expedition (SEAPLEX). The 150 foot *Kaisei*, the organization's flagship vessel, will depart from San Francisco on August 4, 2009 with a team of leading marine scientists and experts in marine debris capture. The *New Horizon*, in an alliance with Project Kaisei, will conduct a 21 day expedition to the gyre for scientific research, with the *Kaisei* traveling for 30 days into the gyre for concurrent studies on netting and capture testing, as well as mapping/tracking observations.

Ocean currents carry marine debris from the shores of North America and Asia to the North Pacific Gyre, an area of the Pacific northeast of Hawaii. Project Kaisei will systematically study the types and quantities of marine debris, the biological impacts that these materials have on the ocean environment and marine life, and investigate innovative technologies that might offer solutions for economically cleaning up marine debris in the world's oceans by converting waste plastics into fuel and products, from textiles to containers.

"The sooner we see the extent of the problem, the better we can work out feasible ways to clean up the mess. But the real solution lays in assuming responsibility for the outcomes of our actions, to start using environmentally-sustainable products and to start disposing of our waste responsibly" said Doug Woodring, Co-Founder and Project Director of Project Kaisei.

Project Kaisei is collaborating with Scripps Institution in San Diego, a leading oceanographic institute, un-

der the umbrella of the "Ocean Recovery Alliance", a format that Project Kaisei will seek to follow with other third-party institutions and organizations in the future. Project Kaisei is also recognized as a "Climate Hero" by the United Nations Environmental Programme (UNEP) in the lead up to the Copenhagen talks.

Project Kaisei is funded by individual donors and sponsors internationally who are committed to preventing, reducing and cleaning up ocean debris in creative new ways.

For more information, to contribute, collaborate, and to pre-register to follow the expedition in real-time with the 'Project Kaisei Interactive Voyage Tracker' please visit: http://www.projectkaisei.org/

ABOUT PROJECT KAISEI

Project Kaisei is a team of innovators, scientists, environmentalists, ocean lovers, sailors, and sports enthusiasts who have come together with a common purpose: to advance the knowledge of and solutions for marine debris. The first expedition to the North Pacific Gyre—with its two vessels—will analyze its structure, assess its impacts on the ocean ecology, determine the feasibility of capturing the debris, explore possible retrieval and processing / recycling and technologies.

Project Kaisei is organized under the Ocean Voyages Institute, which is a non-profit organization devoted to the preservation of the Maritime Arts and Arts and Sciences and the Ocean Environment. Ocean Voyages Institute is a 501(c)(3) California Registered non-profit organization.

About Scripps Institution of Oceanography

Scripps Institution of Oceanography, at the University of California San Diego, is one of the oldest, largest and most respected centers for global science research and education in the world. The National Research Council has ranked Scripps first in faculty quality among oceanography programs nationwide.

One of the two Project Kaisei vessels.

Image courtesy: Project Kaisei, http://www.projectkaisei.org/images/IMG_3081.jpg

Now in its second century of discovery, the scientific scope of the institution has grown to include biological, physical, chemical, geological, geophysical and atmospheric studies of the earth as a system. Hundreds of research programs covering a wide range of scientific areas are under way today in 65 countries. The institution has a staff of about 1,300 and annual expenditures of approximately $155 million from federal, state and private sources. Scripps operates one of the largest U.S. academic fleets with four oceanographic research ships and one research platform for worldwide exploration. Scripps Institution of Oceanography: scripps.ucsd.edu.

Reprinted From:

Press Release at http://www.projectkaisei.org/press/072709%20Project%20Kaisei%20Launch%20Press%20release%20FINAL%20FH.pdf

Even Tiny Organisms Can Stir Up an Ocean

Friday, July 31, 2009

By Henry Fountain

What gets the sea all riled up? Winds and tides do, certainly, but scientists have long wondered how the movement of fish and other organisms — even tiny ones, like zooplankton — might contribute to ocean mixing.

A study by Kakani Katija, a doctoral student at the California Institute of Technology, and her adviser, John O. Dabiri, has determined that the movement of the ocean's organisms makes a significant contribution. But the researchers are not talking about the effects of swishing fins or flippers. Rather, they report in the journal Nature, the mixing is caused just by the movement of bodies through the water.

The concept, called fluid drift, was first proposed by Charles Darwin's grandson, also named Charles. The idea is that a body moving through a fluid will set some of the surrounding fluid into motion. The effect depends on the body's shape and size and is enhanced if the fluid is viscous. For a small organism, seawater is relatively very viscous.

An aggregation of Mastigias jellyfish in Jellyfish Lake Palau.

Photo by: K. Katija/J.Dabiri

The researchers made theoretical calculations but also performed experiments using jellyfish in a saltwater lake on the island of Palau in the Pacific Ocean. During the day, they used dyes "to understand visually what the jellyfish wake looks like," Ms. Katija said. At night, they used a method called laser velocimetry, adapted by Ms. Katija for underwater use, to quantify more precisely the water movement. (A video is at <www.nytimes.com>)

The researchers estimated that globally, the ocean mixing contributed through this drift effect by small marine creatures was roughly equal to that contributed by winds and tides. But their estimates were conservative, they said, because they considered only creatures swimming alone.

What's more, Ms. Katija said, mixing is not limited to living organisms. The drift effect, she said, "is applicable to any body that moves in water." Even a small particle will cause a small amount of mixing as it travels down in the water column.

Reprinted From:

http://www.nytimes.com/2009/08/04/science/04obmixx.html

A version of this article appeared in print on August 4, 2009, on page D3 of the New York edition.

French Scientists to Study Tahiti Marine Life

Aim is to document species and ocean floor

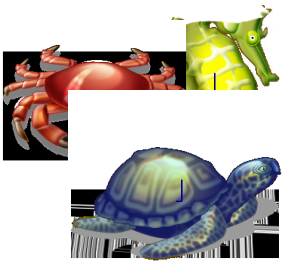
Tuesday, August 4, 2009

Papeéte, Tahiti—The French Research Development Institute (IRD) will conduct an extensive three-month oceanographic study that it claims might help "to discover new species and provide basic molecules of interest" in the French Polynesia seabed.

IRD scientists will conduct the study from Thursday to October 29 aboard the oceanographic research ship Alis. The research will involve two separate studies. The first will focus on the ocean from its surface to a depth of 60 meters (197 feet).

The second study will deal with research in an area 200-800 meters (656-2,624 feet) deep. This is part of what is known as the bathyal zone, a marine ecologic area extending down from the edge of the continental shelf to a depth where the water is 39°F (4° C), an area generally described as lying between 200 and 2,000 m (660-6,600 feet) below the surface, according to the Encyclopedia Britannica online.

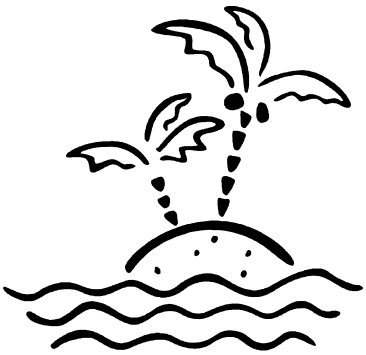
Scientists with various specialties aboard the Alis will first collect samples of benthos, the aquatic organisms that live on, in or near the seabed among the high islands of French Polynesia. They will have the double objective of completing existing knowledge of the area's underwater natural heritage and the geographic distribution of these organisms in the Pacific, according to the IRD.



The study of these organisms' biological properties will then be dealt with in various areas, such as human health and aquaculture, or for their possible environmental applications, the IRD said.

An important part of the analytical work will be conducted in French Polynesia at the recently created Polynesian Center for Island Biodiversity Research (CPRBI), the IRD noted.

The second part of the scientists' work, entitled "Tarasoc," will involve an exploration of the benthic fauna, or tiny creatures found on and within the seabed, of two parallel mountain ranges. This project has three objectives. The first is to describe the fauna and discover probable new species. The second is to seek correlations between the islands' age and isolation as well as study the composition of the benthic fauna and the means that the species have been dispersed.



The third objective is to learn more about certain species through more targeted studies of population genetics, the IRD said.

Reprinted From:

Tahitipresse: www.tahitipresse.pf

What's Going on With SPaRCE

On behalf of the SPaRCE team, I would like to express our condolences to those in Samoa, American Samoa, Tonga, and others that were effected by the September 29th tsunami.

Send in Your Questions!

If you or your students have any questions relating to science please send them to us here at SPaRCE. Once we receive a question we will publish the question and an answer in the next newsletter.

Call for Newsletter Contributions

In order to get to know our schools and participants a bit better, please send us items to be published in the SPaRCE newsletter.

Here is a list of ideas:

- ✉ Accounts of extreme weather events
- ✉ School history
- ✉ Pictures of students taking measurements
- ✉ Activities using SPaRCE data
- ✉ Songs or poems about weather
- ✉ Any other interesting facts about your school or culture.

We are currently working on a 2010 calendar which will be mailed out soon.

For those with a Facebook account, please join the SPaRCE Facebook group. Feel free to post SPaRCE related photos and videos to the group page.

Wishing you a great end of 2009. - Nikki Acton, SPaRCE Coordinator

Welcome to SPaRCE!

Papa Satua Primary School—Samoa

Tailulu College—Tonga

Welcome to the SPaRCE family!
We look forward to working with you!

Classroom Science Focus

Make a Rainbow

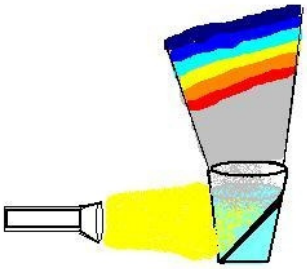
A **rainbow** is an optical and meteorological phenomenon that causes a spectrum of light to appear as an arc in the sky. This is a continuous spectrum of colors, however the discrete bands are an artifact of human color vision. We see the colors red, orange, yellow, green, blue, indigo, and violet. When the Sun shines onto droplets of moisture in the Earth's atmosphere (examples: rain, mist, spray, and dew) the droplets reflect the light and create a rainbow. These colors are often memorized by using the mnemonic Roy G. Biv.

You will need the following:
A clear glass jar with a wide mouth
Water
A mirror (small enough to fit in glass)
A Flashlight
A room with white walls

First, fill the glass with water. Then, carefully place the small mirror into the glass jar, at an angle.

Next, turn the lights off so that you will able to see the rainbow better.

Last, aim the flashlight toward the mirror in the jar. Change the angle of light from the flashlight or change the angle of the mirror until you can see the rainbow on the wall or ceiling.



Explanation:
The mirror reflects light as it passes through the water, traveling at an angle. The water refracts (or bends) the light. As light bends, it separates into the colors of the rainbow, which are red, orange, yellow, green, blue, and violet.

To receive a full color electronic version of this and future newsletters please email nikkiacton@ou.edu

Source: Squidoo. http://www.squidoo.com/weather_science_projects_for_families#module12465817

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WE'RE ON THE WEB!
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ENSO Diagnostic Discussion

Synopsis: **El Niño is expected to strengthen and last through the Northern Hemisphere winter 2009-2010.**

A weak El Niño continued during August 2009, as sea surface temperature (SST) remained above-average across the equatorial Pacific Ocean. Consistent with this warmth, the latest weekly values of the Niño-region SST indices were between +0.7°C to +1.0°C. Subsurface oceanic heat content (average temperatures in the upper 300m of the ocean) anomalies continued to reflect a deep layer of anomalous warmth between the ocean surface and the thermocline, particularly in the central Pacific. Enhanced convection over the western and central Pacific abated during the month, but the pattern of suppressed convection strengthened over Indonesia. Low-level westerly wind anomalies continued to become better established over parts of the equatorial Pacific Ocean. These oceanic and atmospheric anomalies reflect an ongoing weak El Niño.

A majority of the model forecasts for the Niño-3.4 SST index suggest El Niño will reach at least moderate strength during the Northern Hemisphere fall (3-month Niño-3.4 SST index of +1.0°C or greater). Many model forecasts even suggest a strong El Niño (3-month Niño-3.4 SST index in excess of +1.5°C) during the fall and winter, but current observations and trends indicate that El Niño will most likely peak at moderate strength. Therefore, current conditions, trends, and model forecasts favor the continued development of a weak-to-moderate strength El Niño into the Northern Hemisphere fall 2009, with the likelihood of at least a moderate strength El Niño during the winter 2009-10.

Expected El Niño impacts during September-November 2009 include enhanced precipitation over the west-central tropical Pacific Ocean and the continuation of drier-than-average conditions over Indonesia.

NOAA Climate Prediction Center
http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/ensodisc.html

Get to Know: Nathan Lehman

Nate skiing at Steamboat Springs, Colorado

Hey all! I am Nate Lehman and I've been working for OWPI [in the same office as SPaRCE] for about 6 weeks now as Dr. Mark Morrissey's graduate student. For the next several months I will be working on new and improved ways of predicting how fast the wind will blow at 80 meters (the height of most of the wind turbines around here) based on how fast it's blowing at the surface. When I moved to Oklahoma in January of 2007, I never would have guessed I would end up doing wind energy research, but now, I couldn't be more excited about it!

I moved down here from Michigan. I grew up on a small farm in St. Johns, and then went to the University of Michigan. While at U of M, I was captain of both the Rifle Team and Alpine Ski Team, and was the head meteorologist for the Solar Car Team. When I have time, I love to go storm chasing, go hunting and fishing, play golf and soccer, and race my '92 Mustang GT.

Nate and his sister at West Point, New York

Nate's '92 Mustang

Nate fishing with his cousin in Portland, Michigan

SPaRCE would like to thank those of you who have made this program possible: NOAA Office of Global Programs, NOAA PI-GCOS and especially Howard Diamond. Thank you!